ABSTRACT

CHARACTERIZATION OF *p*-METHOXYCINNAMIC ACID – β-CYCLODEXTRIN INCLUSION COMPLEX PREPARED USING SLURRY METHOD

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p-methoxycinnamic acid (*p*MCA), a substance obtained from the hydrolysis of ethyl *p*-methoxycinnamate (E*p*MC). *p*MCA has analgesic activity. *p*MCA has very low solubility in water, which affect on dissolution rate-limited absorbtion of this substance. The purpose of this study was to increase the aqueous solubility of *p*MCA using β-cyclodextrin (βCD) as a complexing agent. The 1:1 *p*MCA-βCD molar ratio was chosen to produce the inclusion complex, by slurry method. In the slurry method, *p*MCA and β-CD were finely suspended in the water at ambient temperature with vigorous stirring. The characterization was compared with *p*MCA, β-CD, and the physical mixture of *p*MCA and β-CD. The inclusion complex formed was characterized using X-ray diffraction, Differential Thermal Analysis (DTA), and Fourier Transform Infrared Spectroscopy (FTIR), also performed dissolution test. Xray result showed that there was a decreasing in diffraction intensity of *p*MCA in the inclusion complex compared to the *p*MCA in the physical mixture. DTA result showed crystalline characteristic of inclusion complex became amorphous with 142,9 °C of melting point, FTIR studies showed there were shift or changes in the spectrum which due to the inclusion complex. The dissolution rate and dissolution efficiency of *p*MCA-β-cyclodextrin inclusion complex was significantly higher than *p*MCA, and physical mixture of *p*MCA-β-cyclodextrin. The result showed that formation of inclusion complexes produce different characteristics in comparison with the single compound of *p*MCA, β-CD, and the physical mixture of *p*MCA-βCD and also increase the dissolution rate of *p*MCA. These changing of characteristic and dissolutin rate result proved that inclusion complex was formed.

Keyword: *p*-methoxycinnamic acid, β-cyclodextrin, inclusion complex, characterization, slurry method.